

In the Claims

1 1. (Currently Amended) A method of cooling a low Z target material of a neutron source
2 assembly, comprising:

3 providing, ~~through~~ by using a nozzle submerged in liquid gallium, a submerged jet of
4 concentrated ~~flow of~~ liquid gallium in a direction normal to a non-bombarded surface of the low
5 Z target material to cool the low Z target material.

1 2. (Previously Presented) The method of claim 1, wherein said step of circulating comprises:

2 providing a reservoir of liquid gallium; and
3 pumping the liquid gallium from the reservoir, through the nozzle, to the low Z target
4 material to cool the target material and through a heat exchanger to remove heat from the liquid
5 gallium.

1 **Claim 3 (Cancelled)**

1 4. (Original) The method of claim 2, wherein the target material comprises beryllium.

1 5. (Currently Amended) A neutron source assembly having a liquid cooled target,
2 comprising:

3 an accelerator based neutron source including a low Z target material that is bombarded
4 by accelerated particles to produce a neutron flux; and

5 a cooling system to circulate liquid gallium through said accelerator based neutron source
6 to cool the low Z target material;

7 said cooling system including a nozzle, said nozzle being submerged in liquid gallium, to
8 provide a submerged jet of concentrated ~~flow of~~ liquid gallium in a direction normal to a non-
9 bombarded surface of the target material.

1 6. (Previously Presented) The neutron source assembly of claim 5, wherein said cooling
2 system comprises:

3 a reservoir of liquid gallium;
4 a heat exchanger in fluid connection with said reservoir of liquid gallium; and
5 means for circulating said liquid gallium between said reservoir of liquid gallium, said
6 heat exchanger and said accelerator based neutron source.

1 7. (Original) The neutron source assembly of claim 6, wherein said means for circulating
2 comprises a pump.

1 8. (Currently Amended) A liquid cooling system for a neutron source assembly, said
2 cooling system comprising:

3 a reservoir of liquid gallium;
4 a heat exchanger in fluid connection with said reservoir of liquid gallium;
5 a nozzle, said nozzle being submerged in liquid gallium, to provide a submerged jet of
6 concentrated ~~flow of~~ liquid gallium in a direction normal to a non-bombarded surface of a low Z
7 target material within the neutron source assembly; and
8 means for circulating said liquid gallium between said reservoir of liquid gallium, said
9 heat exchanger and the neutron source assembly to remove heat from a neutron generating low Z
10 target material within the neutron source assembly.